



Invoice Date	Payee	Invoice #	Wages 01/02/03	Travel 1097	Flagging 2097	Supplies 3097	Advertising 4297	Materials 5097	Equipment 6097	TOTAL
5-Nov-97	Sicamous Bobcat & Excavatin	5708								2,344.00
2-Oct-97	Sicamous Plumbing & Repair	2986								381.30
13-Nov-97	Sicamous Plumbing & Repair	3048								192.25
15-Sep-97	Triple B Contracting	22435								587.25
30-Sep-97	Triple B Contracting	22436								7,482.50
22-Oct-97	Triple B Contracting	22439								2,318.65
3-Dec-97	Terra Registry Services Ltd.	K118092								40.00
23-Sep-97	Valley Blacktop Ltd.	133								317.63
20-Dec-97	Versitile Tree & Crane	23747								1,823.81
25-Nov-97										
9-Dec-97	not responsive									not responsive
										0.00
										0.00
	<b>Repair Total</b>									
	<b>Response Total</b>									
	<b>TOTAL</b>									not responsive

Not Responsive

not responsive

0.00

0.00

not responsive

+ 3000.00 Asset. Acq.

not responsive

Report Parameters

Fiscal Year.....: 2013  
Sort By.....: Responsibility  
Balance Type.....: Actual  
Journal Source(Skip For All)...:  
Journal Category(Skip For All):  
Starting Period.....: MAY-13  
Ending Period.....: MAR-13  
Account Type(Skip For All).....: Expense  
From GL Code Combination.....: 034.55233.61920.0000.5523424.000000.0000  
To GL Code Combination.....: 034.55233.61920.9999.5523424.000000.0000  
Include Zero Balances.....: No

Transportation and Infrastructure

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At: 10:55:17

Report Id: s15

Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description								
Distribution Supplier								
Responsibility: 55233 233 - Okanagan Shuswap District								
				Source Document #			Detail Amount	

not respons ve

Transportation and Infrastructure

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Run On: 2013/03/28  
At: 10:55:17

Report Id: s15  
Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description								
Distribution Supplier								
Responsibility: 55233 233 - Okanagan Shuswap District								
							Detail Amount	

not respons ve

Transportation and Infrastructure

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Account Analysis Detail  
 Period: MAY-13 To MAR-13

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 Run On: 2013/03/28  
 At: 10:55:17  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Distribution Supplier								
Source Document #								
Responsibility: 55233 233 - Okanagan Shuswap District								
Account: s15								
AUG-13								
2012/08/01	Purchase Invo	AP TH 120823	1	2012/08/23	Payables	9571172	1,758.75	
Journal Import Created								
GOLDER ASSOCIATES LTD.								
2012/08/29	Purchase Invo	AP TH 120830	1	2012/08/30	Payables	9585523	2,240.00	1,758.75
Journal Import Created								
GOLDER ASSOCIATES LTD.								
SEP-13								
2012/09/18	Purchase Invo	AP TH 120918	1	2012/09/18	Payables	9626325	6,840.00	3,998.75
Journal Import Created								
GOLDER ASSOCIATES LTD.								
Account Running Balance From MAY-13: 3,998.75								
Period Activity for AUG-13: 3,998.75								
OCT-13								
2012/10/12	Purchase Invo	AP TH 121012	1	2012/10/12	Payables	9687271	8,258.00	6,840.00
Journal Import Created								
BINNIE CONSTRUCTION SERVICES LTD.								
2012/10/17	Purchase Invo	AP TH 121026	1	2012/10/26	Payables	9717257	5,941.80	8,258.00
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.								
2012/10/31	Purchase Invo	AP TH 121031	1	2012/10/31	Payables	9728850	2,849.00	5,941.80
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.								
Account Running Balance From MAY-13: 10,838.75								
Period Activity for SEP-13: 6,840.00								
OCT-13								
2012/10/12	Purchase Invo	AP TH 121012	1	2012/10/12	Payables	9687271	8,258.00	10,838.75
Journal Import Created								
BINNIE CONSTRUCTION SERVICES LTD.								
2012/10/17	Purchase Invo	AP TH 121026	1	2012/10/26	Payables	9717257	5,941.80	8,258.00
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.								
2012/10/31	Purchase Invo	AP TH 121031	1	2012/10/31	Payables	9728850	2,849.00	5,941.80
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.								
Account Running Balance From MAY-13: 27,887.55								
Period Activity for OCT-13: 17,048.80								
NOV-13								
2012/11/01	Purchase Invo	AP TH 121127	1	2012/11/27	Payables	9788308	24,570.00	17,048.80
Journal Import Created								

Report Id: s15  
Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
				Source Document #	Detail Amount			
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
-----								
Account:		s15						
NOV-13								
BINNIE CONSTRUCTION SERVICES LTD.				0074			20,790.00	
BINNIE CONSTRUCTION SERVICES LTD.				0081			3,780.00	
2012/11/01	Purchase Invo	AP TH 121127	1 2012/11/27	Payables	A	9788308	19,254.25-	
Journal Import Created								
GOLDER ASSOCIATES LTD.				508777			19,254.25-	
2012/11/06	Purchase Invo	AP TH 121106	1 2012/11/06	Payables	A	9744399	4,267.80	
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.				803695			4,267.80	
2012/11/20	Purchase Invo	AP TH 121122	1 2012/11/22	Payables	A	9779601	19,254.25	
Journal Import Created								
GOLDER ASSOCIATES LTD.				508777			19,254.25	
2012/11/29	Purchase Invo	AP TH 121129	1 2012/11/29	Payables	A	9794435	50,380.75	
Journal Import Created								
ASSOCIATED ENGINEERING (B.C.) LTD.				47387			50,380.75	
							-----	
Period Activity for NOV-13:							79,218.55	
							-----	
Account Running Balance From MAY-13:							107,106.10	
DEC-13								
2012/12/04	Purchase Invo	AP TH 121204	1 2012/12/04	Payables	A	9806642	2,670.50	
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.				803822			2,670.50	
							-----	
Period Activity for DEC-13:							2,670.50	
							-----	
Account Running Balance From MAY-13:							109,776.60	
JAN-13								
2013/01/01	Purchase Invo	AP TH 130121	1 2013/01/21	Payables	A	9909376	9,547.00	
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.				803981			9,547.00	
2013/01/21	Purchase Invo	AP TH 130128	1 2013/01/28	Payables	A	9924977	9,547.00-	
Journal Import Created								
SUMMIT ENVIRONMENTAL CONSULTANTS INC.				803981			9,547.00-	

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

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 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line	Amount	Balance
				Distribution Supplier			Source Document #	Detail Amount	

-----  
 Responsibility: 55233 233 - Okanagan Shuswap District

Account: s15  
 JAN-13

-----  
 Period Activity for JAN-13: 0.00  
 -----  
 Account Running Balance From MAY-13: 109,776.60

FEB-13

2013/02/01	Purchase Invo	AP TH 130206	1	2013/02/06	Payables	A	9953193	5,380.00-	
Journal Import Created									
				BINNIE CONSTRUCTION SERVICES LTD.	0081			3,780.00-	
				BINNIE CONSTRUCTION SERVICES LTD.	0089			1,600.00-	
2013/02/04	Purchase Invo	AP TH 130204	1	2013/02/04	Payables	A	9944503	1,600.00	
Journal Import Created									
				BINNIE CONSTRUCTION SERVICES LTD.	0089			1,600.00	

-----  
 Period Activity for FEB-13: 3,780.00-  
 -----  
 Account Running Balance From MAY-13: 105,996.60

MAR-13

not responsive



Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

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 Run On: 2013/03/28  
 At: 10:55:17  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line	Amount	Balance
Line Description		Distribution Supplier		Source Document #		Detail Amount			
-----									
Responsibility: 55233 233 - Okanagan Shuswap District									
Account:		s15		Opening Balance:		0.00			
OCT-13									
2012/10/01	Purchase Invo	AP TH 121003	1	2012/10/03	Payables	A	9666047	3,179.60	
Journal Import Created				SUMMIT ENVIRONMENTAL CONSULTANTS INC.		803349		3,179.60	
								-----	
								Period Activity for OCT-13:	3,179.60
								-----	
								Account Running Balance From MAY-13:	3,179.60
								-----	
Account		s15		Total:		3,179.60			

not responsive

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

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 Run On: 2013/03/28  
 At: 10:55:17  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description		Distribution Supplier		Source Document #		Detail Amount		
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
-----								
Account:	s15					Opening Balance:	0.00	
SEP-13								
2012/09/20	Purchase Invo	AP TH 120925	1	2012/09/25	Payables	A 9642146	126,934.39	
Journal Import Created								
ARGO ROAD MAINTENANCE (NORTH OKANAGAN) INC.				001733		126,934.39		
							-----	
Period Activity for SEP-13:							126,934.39	
Account Running Balance From MAY-13:							126,934.39	
-----								
OCT-13								
2012/10/15	Purchase Invo	AP TH 121018	1	2012/10/18	Payables	A 9699552	22,200.00	
Journal Import Created								
WESTCANA ELECTRIC INC.				21477		22,200.00		
							-----	
Period Activity for OCT-13:							22,200.00	
Account Running Balance From MAY-13:							149,134.39	
-----								
NOV-13								
2012/11/02	Purchase Invo	AP TH 121102	1	2012/11/02	Payables	A 9735755	231,165.88	
Journal Import Created								
ARGO ROAD MAINTENANCE (NORTH OKANAGAN) INC.				001762		231,165.88		
2012/11/29	Purchase Invo	AP TH 121129	1	2012/11/29	Payables	A 9794435	56,037.60	
Journal Import Created								
ARGO ROAD MAINTENANCE (NORTH OKANAGAN) INC.				001777		56,037.60		
							-----	
Period Activity for NOV-13:							287,203.48	
Account Running Balance From MAY-13:							436,337.87	
-----								
FEB-13								
2013/02/01	Purchase Invo	AP TH 130219	1	2013/02/19	Payables	A 9979933	751,412.31	
Journal Import Created								
ARGO ROAD MAINTENANCE (NORTH OKANAGAN) INC.				001787		699,384.74		
ARGO ROAD MAINTENANCE (NORTH OKANAGAN) INC.				001800		52,027.57		
							-----	
Period Activity for FEB-13:							751,412.31	
Account Running Balance From MAY-13:							1,187,750.18	
-----								

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

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 At: 10:55:17  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line	Amount	Balance
Line Description		Distribution Supplier		Source Document #		Detail Amount			

Responsibility: 55233 233 - Okanagan Shuswap District

Account: s15  
 MAR-13

not respons ve

2013/03/20	Purchase Invo	AP TH	130320	1	2013/03/20	Payables	A	10061334	15,415.56
Journal Import Created		ARGO ROAD MAINTENANCE (NORTH OKANAGAN) INC.				001858			15,415.56

Period Activity for MAR-13:

Account Running Balance From MAY-13: not respons ve

Account 034.55233.61920.6906.5523424.000000.0000 Total:

not respons ve

Account: s15  
 AUG-13

Opening Balance: 0.00

2012/08/08	Purchase Invo	AP TH	120808	1	2012/08/08	Payables	A	9538995	554.00
Journal Import Created		SELKIRK MOUNTAIN HELICOPTERS LTD.				5106			554.00

Period Activity for AUG-13: 554.00

Account Running Balance From MAY-13: 554.00

Account s15 Total: 554.00

Transportation and Infrastructure

Report Id: s15  
Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description	Distribution	Supplier		Source Document #			Detail Amount	
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
-----								
Account:		s15					Opening Balance:	0.00
AUG-13								
2012/08/29	Purchase Invo	AP TH 120829	1	2012/08/29	Payables	A 9582405	57.94	
Journal Import Created								
BANK OF MONTREAL (MASTERCARD)								
					FEHR 824195	AUG12	57.94	
								-----
Period Activity for AUG-13:								57.94
Account Running Balance From MAY-13:								57.94
								-----
Account s15 Total:								57.94
-----								
Account:		s15					Opening Balance:	0.00
MAR-13								
2013/03/18	Purchase Invo	AP TH 130319	1	2013/03/19	Payables	A 10057535	611.94-	
Journal Import Created								
ZZ T & H PROJECT TRANSFERS ORACLE								
					TH233130006		611.94-	
								-----
Period Activity for MAR-13:								611.94-
Account Running Balance From MAY-13:								611.94-
								-----
Account s15 Total:								611.94-
-----								

not responsive

Report Id: s15

Transportation and Infrastructure

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Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description		Distribution Supplier			Source Document #		Detail Amount	
Responsibility: 55233 233 - Okanagan Shuswap District								

not responsive

Report Id: s15  
Requestor:

Transportation and Infrastructure  
Account Analysis Detail

Page: 1  
Run On: 2013/03/28  
At: 10:59:35

Report Parameters

Fiscal Year.....: 2013  
Sort By.....: Responsibility  
Balance Type.....: Actual  
Journal Source(Skip For All)...:  
Journal Category(Skip For All):  
Starting Period.....: MAY-13  
Ending Period.....: MAR-13  
Account Type(Skip For All)....: Expense  
From GL Code Combination.....: 034.55233.62181.0000.5523466.000000.0000  
To GL Code Combination.....: 034.55233.62181.9999.5523466.000000.0000  
Include Zero Balances.....: No

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

Page: 2  
 Run On: 2013/03/28  
 At: 10:59:35  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description		Distribution Supplier		Source Document #		Detail Amount		
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
-----								
Account:	s15					Opening Balance:	0.00	
NOV-13								
2012/11/01	Purchase Invo	AP TH 121127	1	2012/11/27	Payables	A 9788308	19,254.25	
				Journal Import Created				
				GOLDER ASSOCIATES LTD.		508777	19,254.25	
2012/11/29	Purchase Invo	AP TH 121129	1	2012/11/29	Payables	A 9794435	1,498.00	
				Journal Import Created				
				TERRA REMOTE SENSING INC.		2583	1,498.00	
							-----	
							Period Activity for NOV-13:	20,752.25
							-----	
							Account Running Balance From MAY-13:	20,752.25
-----								
DEC-13								
2012/12/28	Purchase Invo	AP TH 121231	1	2012/12/31	Payables	A 9858822	16,033.50	
				Journal Import Created				
				GOLDER ASSOCIATES LTD.		516291	16,033.50	
							-----	
							Period Activity for DEC-13:	16,033.50
							-----	
							Account Running Balance From MAY-13:	36,785.75
-----								
JAN-13								
2013/01/15	Purchase Invo	AP TH 130122	1	2013/01/22	Payables	A 9912312	6,133.75	
				Journal Import Created				
				GOLDER ASSOCIATES LTD.		520869	6,133.75	
							-----	
							Period Activity for JAN-13:	6,133.75
							-----	
							Account Running Balance From MAY-13:	42,919.50
-----								
FEB-13								
2013/02/01	Purchase Invo	AP TH 130206	1	2013/02/06	Payables	A 9953193	9,547.00	
				Journal Import Created				
				SUMMIT ENVIRONMENTAL CONSULTANTS INC.		803981	9,547.00	
2013/02/13	Purchase Invo	AP TH 130213	1	2013/02/13	Payables	A 9967265	3,780.00	
				Journal Import Created				
				BINNIE CONSTRUCTION SERVICES LTD.		0081	3,780.00	
2013/02/14	Purchase Invo	AP TH 130214	1	2013/02/14	Payables	A 9970220	1,600.00	
				Journal Import Created				

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

Page: 3  
 Run On: 2013/03/28  
 At: 10:59:35  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance	
Line Description						Detail Amount			
Distribution Supplier				Source Document #					
-----									
Responsibility: 55233 233 - Okanagan Shuswap District									
-----									
Account:		s15							
FEB-13									
2013/02/26	Purchase Invo	AP TH 130226	1	2013/02/26	Payables	9998047	1,600.00		
BINNIE CONSTRUCTION SERVICES LTD.							9,496.50		
Journal Import Created									
2013/02/28	Purchase Invo	AP TH 130228	1	2013/02/28	Payables	10005007	9,496.50		
SUMMIT ENVIRONMENTAL CONSULTANTS INC.							800.00		
Journal Import Created									
GOLDER ASSOCIATES LTD.							800.00		
							-----		
Period Activity for FEB-13:							25,223.50		
							-----		
Account Running Balance From MAY-13:							68,143.00		
MAR-13									
2013/03/18	Purchase Invo	AP TH 130318	1	2013/03/18	Payables	10054285	31,645.55		
BINNIE CONSTRUCTION SERVICES LTD.									
Journal Import Created									
2013/03/21	Purchase Invo	AP TH 130321	1	2013/03/21	Payables	10064603	31,645.55		
BINNIE CONSTRUCTION SERVICES LTD.							56,727.25		
Journal Import Created									
2013/03/25	Purchase Invo	AP TH 130325	1	2013/03/25	Payables	10072043	36,697.00		
BINNIE CONSTRUCTION SERVICES LTD.							20,030.25		
GOLDER ASSOCIATES LTD.							2,320.00		
2013/03/27	Purchase Invo	AP TH 130327	1	2013/03/27	Payables	10079340	2,320.00		
BINNIE CONSTRUCTION SERVICES LTD.							39,575.60		
Journal Import Created									
SUMMIT ENVIRONMENTAL CONSULTANTS INC.							32,378.60		
SUMMIT ENVIRONMENTAL CONSULTANTS INC.							7,197.00		
							-----		
Period Activity for MAR-13:							130,268.40		
							-----		
Account Running Balance From MAY-13:							198,411.40		
							-----		
Account							s15	Total:	198,411.40



Transportation and Infrastructure

Report Id: s15  
Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description	Distribution	Supplier	Source Document #	Detail Amount				
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
Account:		s15		Opening Balance:				0.00
MAR-13								
2013/03/14	Purchase Invo	AP TH 130314	1	2013/03/14	Payables	A 10047258	187.42	
Journal Import Created								
TRIG'S SEPTIC SERVICE				6537			187.42	
							-----	
							Period Activity for MAR-13:	187.42
							-----	
							Account Running Balance From MAY-13:	187.42
							-----	
Account				s15	Total:		187.42	
Account:		s15		Opening Balance:				0.00
NOV-13								
2012/11/29	Purchase Invo	AP TH 121130	1	2012/11/30	Payables	A 9797532	3,450.00	
Journal Import Created								
BROWNE JOHNSON LAND SURVEYORS				391-12NOV20			3,450.00	
							-----	
							Period Activity for NOV-13:	3,450.00
							-----	
							Account Running Balance From MAY-13:	3,450.00
							-----	
MAR-13								
2013/03/06	Purchase Invo	AP TH 130306	1	2013/03/06	Payables	A 10025175	420.00	
Journal Import Created								
COLDSTREAM CRANE SERVICE LTD.				716			420.00	
2013/03/27	Purchase Invo	AP TH 130327	1	2013/03/27	Payables	A 10079340	753.00	
Journal Import Created								
SHUSWAP LAND SERVICES LTD.				13127			753.00	
							-----	
							Period Activity for MAR-13:	1,173.00
							-----	
							Account Running Balance From MAY-13:	4,623.00
							-----	
Account				s15	Total:		4,623.00	

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
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 At: 10:59:35  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
Line Description	Distribution Supplier			Source Document #			Detail Amount	
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
-----								
Account:	s15					Opening Balance:	0.00	
FEB-13								
2013/02/28	CGI-Inter	0010070881313020	2013/03/06	CGI - FI	A	10022254	2,500.00	
PSB GOODS ACQ FEE REQ R020635 PO-005364								
							-----	
							Period Activity for FEB-13:	2,500.00
							-----	
							Account Running Balance From MAY-13:	2,500.00
-----								
MAR-13								
2013/03/18	Purchase Invo	AP TH 130319	1 2013/03/19	Payables	A	10057535	330.00	
Journal Import Created								
BANK OF MONTREAL (MASTERCARD)								
2013/03/25	Purchase Invo	AP TH 130326	1 2013/03/26	Payables	A	10075501	5,088.16	
Journal Import Created								
NAPA AUTO PARTS								
NAPA AUTO PARTS								
NAPA AUTO PARTS								
ATLANTIC INDUSTRIES LIMITED								
							-----	
							Period Activity for MAR-13:	5,418.16
							-----	
							Account Running Balance From MAY-13:	7,918.16
-----								
Account					s15	Total:	7,918.16	

Report Id: s15  
Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Account Analysis Detail  
Period: MAY-13 To MAR-13

Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line Amount	Balance
				Source Document #	Detail Amount			
-----								
Responsibility: 55233 233 - Okanagan Shuswap District								
-----								
Account:	s15					Opening Balance:	0.00	
MAR-13								
2013/03/12	Purchase Invo	AP TH 130312	1	2013/03/12	Payables	A 10040311	8,306.74	
Journal Import Created								
				NORTHWAY ENTERPRISES	272718		5,681.74	
				FACTS - FIRST AID CERTIFIED TRAINING SYSTEMS LTD	5275		2,625.00	
2013/03/14	Purchase Invo	AP TH 130314	1	2013/03/14	Payables	A 10047258	10,627.70	
Journal Import Created								
				G & L CATWORK LTD.	052062		10,627.70	
2013/03/18	Purchase Invo	AP TH 130318	1	2013/03/18	Payables	A 10054285	6,140.04	
Journal Import Created								
				LEPINE, MILTON	418464		6,140.04	
2013/03/21	Purchase Invo	AP TH 130321	1	2013/03/21	Payables	A 10064603	4,443.75	
Journal Import Created								
				INTERROUTE CONSTRUCTION LTD.	002462		4,443.75	
2013/03/25	Purchase Invo	AP TH 130325	1	2013/03/25	Payables	A 10072043	9,750.34	
Journal Import Created								
				WHITEHEAD ENTERPRISES LTD.	1262		8,762.82	
				NAPA AUTO PARTS	193544		180.00	
				NAPA AUTO PARTS	193545		327.52	
				NAPA AUTO PARTS	193547		480.00	
2013/03/25	Purchase Invo	AP TH 130326	1	2013/03/26	Payables	A 10075501	56,780.72	
Journal Import Created								
				G & L CATWORK LTD.	052062-A		1,317.16	
				G & L CATWORK LTD.	052064		20,133.16	
				VAN OMMEN CONTRACTING LTD.	1164		6,151.50	
				WHITEHEAD ENTERPRISES LTD.	1264		7,377.50	
				NORTHWAY ENTERPRISES	272723		1,710.90	
				MOUNCE CONSTRUCTION LTD.	4136		13,310.50	
				HORIZON TREE SERVICE LTD.	5349		3,480.00	
				HORIZON TREE SERVICE LTD.	5366		1,200.00	
				HORIZON TREE SERVICE LTD.	5384		2,100.00	
2013/03/27	Purchase Invo	AP TH 130327	1	2013/03/27	Payables	A 10079340	23,888.66	
Journal Import Created								
				G & L CATWORK LTD.	052067		8,703.00	
				G & L CATWORK LTD.	151864		500.00	
				MOUNCE CONSTRUCTION LTD.	4138		7,011.87	
				FACTS - FIRST AID CERTIFIED TRAINING SYSTEMS LTD	5309		2,028.13	
				FACTS - FIRST AID CERTIFIED TRAINING SYSTEMS LTD	5318		778.13	
				FACTS - FIRST AID CERTIFIED TRAINING SYSTEMS LTD	5319		2,407.26	

Report Id: s15  
 Fiscal Year : 2013  
 Balance Type: Actual  
 Client : 034

Transportation and Infrastructure

Account Analysis Detail  
 Period: MAY-13 To MAR-13

Page: 7  
 Run On: 2013/03/28  
 At: 10:59:35  
 Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line	Amount	Balance
Line Description	Distribution	Supplier		Source Document #					Detail Amount

Responsibility: 55233 233 - Okanagan Shuswap District

Account: s15  
 MAR-13

FACTS - FIRST AID CERTIFIED TRAINING SYSTEMS LTD	5320							2,460.27	
								-----	
								Period Activity for MAR-13:	119,937.95
								-----	
								Account Running Balance From MAY-13:	119,937.95
								-----	
				Account		s15		Total:	119,937.95

Account: s15  
 MAR-13

Opening Balance: 0.00

2013/03/27 Purchase Invo	AP TH 130327	1	2013/03/27	Payables	A	10079340		560.00	
Journal Import Created									
DENBIL ENTERPRISES LTD.				SAARMIN4042				560.00	
								-----	
								Period Activity for MAR-13:	560.00
								-----	
								Account Running Balance From MAY-13:	560.00
								-----	
				Account		s15		Total:	560.00

not responsive

Report Id: s15  
Fiscal Year : 2013  
Balance Type: Actual  
Client : 034

Transportation and Infrastructure

Account Analysis Detail  
Period: MAY-13 To MAR-13

Page: 8  
Run On: 2013/03/28  
At: 10:59:35  
Account Type: Expense

Effective Date	Category	Batch	Posted Date	Source	Type	GL Document #	Line	Amount	Balance
Line Description	Distribution	Supplier		Source Document #				Detail Amount	
-----									
Responsibility: 55233 233 - Okanagan Shuswap District									
								-----	
Responsibility 55233 233 - Okanagan Shuswap District Total:								-	
Client 034 Total:								-	not responsive
Report Total:								=	

# HUMMINGBIRD CREEK DEBRIS FLOW DECISION ANALYSIS

Final Report



G09143 01

June 2003

## **EXECUTIVE SUMMARY**

On July 11, 1997, one of the largest non-volcanic debris flows in British Columbia history impacted Swansea Point, resulting in physical damage of over \$4,000,000 (2003 \$CAN), with one indirect death from heart attack. There is ongoing risk to Swansea Point from debris flows.

The Ministry of Transportation and Ministry of Community, Aboriginal and Women's Services retained Klohn Crippen Consultants Ltd. to review background information, review mitigation options and to conduct a decision analysis to select a mitigation option that will provide a reasonable level of protection to Swansea Point. The decision analysis framework consists of an evaluation of annualized total cost including both capital construction cost and risk cost. Costs include restitution of physical damage, clean-up and capital construction, but do not include environmental damages, bodily injury or loss of life, loss of use or loss of enjoyment, or litigation. The effects of debris flows were only considered at Swansea Point, not higher in the watershed. Risk of loss of life was assessed in separately from the cost-based decision analysis.

Klohn Crippen conducted a field visit, a review of background information including debris flow history and mitigative options, a review of hydrologic data and trends, and a review of cost data. A decision tree framework was built using the background information as inputs to evaluate the options.

A Failure Modes and Effects Analysis (FMEA) and Probabilistic Risk Analysis (PRA) were conducted. These analyses reduce the debris flow system into components that can be evaluated individually or systemically. The FMEA results in estimates of damage cost that are used in the PRA which uses probability distributions and cost inputs in a decision

tree to evaluate the probable annual cost resultant of each option. The key equation of this study is the evaluation of annualized total cost or:

$$C_T = C_C + C_R \quad (1)$$

Capital costs are based on conceptual designs of mitigative options and should be considered with a 25% to 40% contingency allowance if used for purposes beyond this decision analysis, such as for budgeting. The selected mitigation will need to proceed to detailed design prior to preparation of budget-level cost estimates. Risk costs are based on estimates of damage calibrated to the damage and cost of the 1997 debris flow event. Actual damage from future events will depend on local factors that cannot be accurately predicted. The total cost output is a relative comparison of three mitigation options. This comparison of cost assumes that principle stakeholders are not risk adverse to monetary factors.

The PRA relies on probabilities to quantify uncertainties. For this site, these probabilities are based on a combination of available data and subjective judgment. Judgmental probabilities rely on the amount and quality of information available and the experience of the assessor. Future evaluations of this site will change based on improved data and knowledge of the site characteristics.

Swansea Point, is located 10 km south of Sicamous on Highway 97A on the east shore of Mara Lake, built on an alluvial fan below the confluence of Mara and Hummingbird Creeks. The creeks are about 6 km in length with a combined catchment of 39 km<sup>2</sup>, with steep headwater and transport segments and a flatter alluvial fan deposition area.

Review of rainfall and snowpack data from the nearby Salmon Arm and Enderby stations found that the 4- to 7-day rainfall was on the order of 30 to 80 year return period, the 3-month rainfall and the 9-month rain and snow accumulation were both of a 100 to 200 year return period. The rainfall trend-line has been increasing since 1900, and this trend



is expected to increase through the 21st century. On this basis, the future frequency of debris flows is expected to increase.

Site bedrock (plutonic and metamorphic rock) has foliations, jointing, folding and faults throughout the region, with several lineations present in the Mara and Hummingbird catchments. Highly fractured rock serves as preferential seepage pathways for seepage. Surficial deposits include colluvial, fluvial, glaciofluvial, glaciolacustrine and morainal materials. Geologic processes, including rockfall, rockslides, debris slides, debris flows, soil and rock slumps and gully erosion modify the landscape. Both natural and man-made influences have caused slides. There is an ongoing risk of slope failures in or above the Mara and Hummingbird gullies.

The alluvial fan has formed from colluvial and alluvial processes over the last 10,000 years since glaciation. The mix of processes has created a complex geology with interlayers of high and low permeability layers. Water wells are expected to have widely varying yields due to local geologic variations.

Swansea Point includes approximately 270 lots with 90% developed as residences varying from 5th wheel trailers, to trailer parks to large single family homes. Utilities include gas, power, cable, and telephone. Development began in the early 1900's and current population is estimated at 500 to 600. Highway 97A crosses the eastern edge of the fan and there is a well-developed system of local roads. Forest harvesting and road building is ongoing in the watersheds.

The 1997 debris flow event of 92,000 m<sup>3</sup> is the only verified recorded event at Swansea Point. Damaging debris flows are defined in this report as events larger than 1,000 m<sup>3</sup>. Other evidence of damaging debris flows includes five possible events identified in lake sediment cores, seven possible events identified by tree ring damage, three events

identified by anecdote, and two to four events identified by air photograph interpretation of debris on the fan. Overall, there have been an estimated six to ten damaging debris flow or flood events in the last 75 years, or approximately eight to thirteen events per century, i.e., the annual probability of a damaging debris flow or flood event is 0.08 to 0.13. Future frequency is expected to increase due to hydrologic evidence and continued anthropogenic development.

Three debris flow frequency Scenarios were examined. Scenario 1 assumes a high frequency (0.17 annual probability) of damaging debris flows, Scenario 2 assumes a medium frequency (0.11 annual probability) and Scenario 3 assumes a lower frequency (0.08 annual probability). Six debris flow categories or event states were defined, classifying debris flows by size and three magnitude-recurrence relationships were derived for use in the high, medium and low frequency scenarios. Each magnitude-recurrence relationship was calibrated to the assumed annual probability of damaging event and checked against the actual fan accumulation rate of between 1,100 and 5,400 m<sup>3</sup> and meeting the requirement that events within Event State 4 recurred at between a 30 and 300 year interval, being the high and low frequency boundaries.

An acceptable threshold for debris flow hazard prior to subdivision approval is 1:10,000 (Cave, 1991). Swansea Point has a 1:6 to 1:15 annual probability of damaging debris flow (>1,000 m<sup>3</sup>), with a 1:75 to 1:300 annual probability of a large (>50,000 m<sup>3</sup>) debris flow. Boyer (2000) indicates that hazard at subdivisions with protective works should be at least 1:500 to 1:10,000. Mitigative measures at Swansea Point should reduce the annual probability of hazard to at least 1:500.

Mitigative measures could include passive or active options. Three options were selected for decision analysis, which represent minimum, intermediate and maximum capital cost, and provide a minimal, moderate and high reduction in risk respectively.

Option 1 includes Channel Improvements that reduce flood hazard but do not appreciably reduce risk from debris flow. Some channel improvements have been implemented but this work is currently on hold. Our opinion of probable cost of this option is \$750,000 and this value was used for the decision analysis.

Option 2 includes a debris containment berm sized to contain 25,000 m<sup>3</sup>, with associated training berms, retaining wall and outlet structures. Significant property acquisition would be required. This option may have the risk of diverting debris overflow into areas that it would not currently reach. Our opinion of probable cost of this option is \$1,500,000.

Option 3 includes a debris containment berm sized to contain 150,000 m<sup>3</sup> with associated outlet structures and retaining wall. This option would require significant property acquisition. The Ministry of Transportation currently plans to upgrade the Highway 97A crossing. This proposed highway improvement may be incorporated into the Option 3 design, but additional study is required to verify the feasibility of combining these two projects. For the purpose of this decision analysis, the highway crossing cost savings is assumed to be additional irrespective of the mitigation option.

If the above opinions of cost are to be used for budgetary purposes, a contingency of 25% to 40% should be applied. At 33%, this would increase the cost estimates to approximately \$1M for Option 1, \$2M for Option 2 and \$4M for Option 3. Decision analyses were conducted without application of contingency.

Other mitigative measures, including warning systems, forest management practices, check dams, impediments to flow, lateral or deflection berms, and creek channel linings were considered, and some aspects may be incorporated into the final selected mitigation option.

The FMEA examined the effects of direct and indirect impact on developments Swansea Point using DAN to predict the typical run-out distance of debris flows. Estimates of number of lots and homes impacted and the typical damage of debris flows from each of the six Event States were made. Six Damage States were defined to assist in evaluating the typical damage expected and in preparing a probability distribution of damage from average debris flow events. The damage probability distributions were varied until the end result, the expected damage cost was equal to the typical damage cost for Option 1, i.e., the situation with minimal mitigative measures. The probability of damages was reduced accordingly to reflect the reduction in expected damage costs with the implementation of mitigative Options 2 or 3. The expected damage cost becomes the risk cost in the decision matrix. Damage costs were calibrated against the actual cost of the 1997 debris flow.

The probability of the death of an individual (PDI) was calculated. The PDI does not predict the total number of deaths expected annually, but rather the increased risk of fatality to any given individual resident of Swansea Point, assuming a uniform application of hazard across the fan. In this regard, the PDI is considered a relative, not an absolute measure, of the risk of loss of life. It was found that the implementation of Option 2 would reduce the PDI risk by half and that Option 3 would reduce the risk by 75%. History indicates the risk of loss of life at Swansea Point is real and there is a strong likelihood of loss of life if no remediation is undertaken.

Decision Trees were prepared for three Scenarios, High, Medium and Low Frequency, each evaluating three mitigative options, with six debris flow event states or classes, and six possible damage states from each debris flow. The summation of the end nodes represents the risk cost ( $C_R$ ) of each option. The capital cost estimates were annualized by applying a discount rate of 4.5% and this capital cost ( $C_c$ ) was added to the risk cost to prepare estimates of total annualized cost for each option within each scenario.

Option 3 was the lowest total cost in Scenario 1 (high frequency), and Option 2 was the lowest total cost in Scenario 2 (medium frequency) and Scenario 3 (low frequency). Option 1 is not recommended on the basis of annualized total cost.

The sensitivity of the decision analysis to the magnitude-recurrence frequency relationship (low, medium or high) was assessed by weighting the outcomes of each Scenario. The first blended scenario used an equal distribution of low/medium/high outcomes and the second blended scenario used a 20%/60%/20% blend of the low/medium/high outcomes. In the first blended Scenario, Option 2 is 5% lower cost than Option 3. In the second blend, Option 3 is 5% lower than Option 2. We conclude, in terms of lowest annualized total cost that Options 2 and 3 are essentially equal.

The sensitivity to the discount rate was also examined. The analysis is relatively insensitive to changes to the discount rate in the range of about 3.5% to 5%.

Option 3 has the added benefit of providing the greatest reduction in the Probability of the Death of an Individual. Option 3 would likely also reduce the debris flow hazard into the 1:500 to 1:10,000 range recommended for subdivision development with protective works and may allow incorporation of the MOT's planned highway culvert crossing upgrade for a further cost savings.

Development in high hazard areas on Swansea Point should not proceed without implementation of mitigative measures to reduce the risk. Ongoing forestry development in the Mara and Hummingbird watersheds should be carefully planned and designed so as to not worsen the hazard.